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PATENT APPLICATION
09/849,003

In The United States Patent and Trademark Office
On Appeal From The Examiner To The Board
of Patent Appeals and Interferences

In re Application of:	Edward Alton Harbin
Serial No.	09/849,003
Filing Date:	May 4, 2001
Group Art Unit:	2141
Examiner:	Djenane M. Bayard
Title:	Unique Address Space and Method for a Transport Network

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Willie Jiles

Willie Jiles

Date: August 26, 2005

Appeal Brief

Appellant has appealed to the Board of Patent Appeals and Interferences from the decision of the Examiner mailed March 16, 2005, finally rejecting Claims 1-18, all of which are pending in this case. Appellant filed a Notice of Appeal on June 27, 2005. Appellant respectfully submits this Appeal Brief with the statutory fee of $500.00.

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Real Party In Interest

This application is currently owned by Fujitsu Network Communications, as indicated by an assignment recorded on July 19, 2001, in the Assignment Records of the United States Patent and Trademark Office at Reel 012015, Frames 0194 to 0196.

Related Appeals and Interferences

There are no known appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision regarding this appeal.

Status of Claims

Claims 1-18 are pending in this application. Claims 1-18 are rejected pursuant to a final Office Action mailed March 16, 2005, and are all presented for appeal. All pending claims are shown in Appendix A.

Status of Amendments

All amendments submitted by Appellant were entered by the Examiner before the issuance of the final Office Action mailed March 16, 2005.

Summary of Claimed Subject Matter

Embodiments of the present invention include a transport network that utilizes an internal address space that is reserved and non-forwardable in external Internet protocol (IP) networks. The transport network translates between the internal address space and the external IP address space to prevent address conflicts between the networks and to reduce needed IP addresses.

Referring to Figure 1 of the application, a transport network 10 in accordance with one embodiment of the present invention is illustrated. The transport network 10 includes a plurality of Internet protocol transport (IPT) nodes 30 interconnected by communication links 32. In particular embodiments, the transport network 10 utilizes a private internal addressing scheme to isolate the network 10 from customers and thus minimize or prevent conflicts with private and/or public networks connected to the transport network 10. This reduces the complexity of network management and preserves the topology of the existing routed network 12. In addition, transport network isolation enables value added services to be provided through the transport network 10. *Page 9, lines 24-32.*

When an independent addressing scheme is utilized for the transport network 10, egress traffic is converted from the external addressing scheme to the internal addressing scheme at ports 34 of nodes 30 using standardized or extended network address translation (NAT). Similarly, egress traffic is converted from the internal addressing scheme back to the external addressing scheme at ports 34 using standard or extended NAT. In addition to the internal addresses, each IPT node 30, port 34 and other component of the transport network 10 visible to the external network 12 includes a globally unique IP address. These addresses are used for external management of the transport network 10. *Page 10, lines 1-13.*

FIGURE 3 illustrates details of the IPT node 30 in accordance with one embodiment of the present invention. Referring to FIGURE 3, the IPT node 30 includes one or more receiver-transceiver pairs (RTP) 100 and a processing system 102 interconnected by an internal Ethernet connection. Each RTP 100 includes one or more internal interfaces 104 and one or more external interfaces 106. The internal interfaces are high-speed interfaces

between the IPT nodes 30 while the external interfaces 106 are low-speed ports 34 accessible to external nodes. The internal and local interfaces 104 and 106 may each be implemented as one or more discrete cards. *Page 12, line 29 – Page 13, line 7.*

In one embodiment, a non-forwardable address space of the external network is used in the transport network 10 to route management and/or control traffic. In a particular embodiment, the non-forwardable address space may be Internet Assigned Number Authority (IANA) reserved looped back address space. In this embodiment, the local interface 106 or other boundary interface is provided with NAT to map external IP addresses for messages generated outside the network to internal loop back addresses such that any, all or specified CPUs and other components in the transport network 10 can be addressed in a suitable external address space. The loop back address space may utilize a naming convention identifying the traffic as belonging to the loop back space and identifying the source and/or destination node and component of the node. In a particular embodiment, the naming convention comprises: 127, node identifier, port or CPU identifier. The 127 identifies the traffic as belonging to the IANA loop back address space. The node and the port or CPU identifiers may be a number or other unique identifier in the address space of the transport network 10. *Page 13, line 31 – Page 14, line 22.*

In operation, the management station 20 or other external station generates a message for a CPU or other addressable component of the transport network 10. The message includes a message data and external source and destination IP addresses. The message is forwarded using the IP addresses to a management ingress port or point of the transport network 10 corresponding to the destination IP address. At the ingress port, the external IP address are translated to the internal loop back traffic address space dynamically and/or using lookup tables. During translation, the external IP address is replaced with the loop back address identifier with the node and component also being transmitted based on included external identifiers of the node and component. In addition, the original source address is replaced with a management port or other suitable egress port address. The original source address is stored for translation of reply traffic. *Page 14, line 23 – Page 15, line 8.*

The IPT nodes 30 are configured with a modified TCP/IP stack to route the loop back addressed traffic to an identified destination node for delivery to the destination port or CPU. Responses from a destination CPU are routed to the management port, which is the egress port for response traffic, using the internal source address. At the management port, the destination port address is translated to the original source address for transmission in the external network and delivery to an external station. In this way, the internal topology is protected and many components are externally addressable using a reduced number of IP addresses which may be suitably scaled. Multiple loop back addresses may be assigned to an interface for communicating with multiple external stations. Processors in the transport network 10 may also use the loop back address space to communicated control messages. In this case, however, no translation is required. *Page 15, lines 9-26.*

FIGURE 13 illustrates a method for routing messages in the transport network using a unique internal address space and for translating between the internal address space and an external IP address space in accordance with one embodiment of the present invention. In this embodiment, the IANA reserve loop back address space is used to address and route messages within the transport network 10. This may allow the internal topology to be protected from the external network, prevent conflicts between address spaces of the transport network and the external network or networks, and allow a single or reduced set of IP addresses to be used by a management or other external station to address components of the transport network 10. *Page 27, line 22 – Page 28, line 3.*

Referring to FIGURE 13, the method begins at step 550 in which a management station 20 generates message data for an element of the transport network 10. At step 552, the message data is addressed with external IP addresses for forwarding in the external network. The IP addresses include the source address of the management station and the destination address of a management port of the transport network 10. The destination address also includes an external identifier of the transport node and component. At step 554, the message is routed to the management port based on the external IP addresses. *Page 28, lines 4-17.*

Proceeding to step 556, at the boundary interface of the transport network, the IP source address is stored for addressing of reply traffic. At step 558, the IP addresses are translated to internal loop back addresses. In a particular embodiment, the destination address may be translated to a 127 loop back address space and internal node and component identifiers using a look up table. The source address is translated to the management port of the transport network for reply traffic. The message is routed to the destination element in the transport network 10 based on the internal loop back address. *Page 28, lines 18-29.*

Proceeding to step 562, the network element processes the message and generates a response. At step 564, the response is addressed with the internal loop back addresses of the component and the management port. At step 566, the response is routed to management port based on the internal loop back address. Next, at step 568, the internal addresses are translated to the external IP address. In one embodiment, the destination loop back address of the management port is replaced with the original IP source address. At step 570, the response is routed to the base station 20 that originated the message based on external IP addresses. However, the message may be otherwise addressed and routed to and within the transport network 10 without departing from the scope of the present invention. *Page 28, line 30 – Page 29, line 13.*

Grounds of Rejection to be Reviewed on Appeal

Appellant requests that the Board review the Examiner's rejection of Claims 1-18 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,457,061 issued to Bal et al. (*"Bal"*)

Argument

The Examiner's rejections of Claims 1-18 is improper, and the Board should withdraw the rejections for the reasons given below.

I. The Examiner's Rejection of Independent Claims 1, 7, and 13 Over *Bal* is Improper

The Examiner rejects Claims 1-18 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,457,061 issued to Bal et al. (*"Bal"*).

Independent Claim 1 recites the following limitations:

> A method for routing an externally generated message in a network, comprising:
>
> receiving at an ingress port of an internal network a message from an external network, the message comprising internet protocol (IP) source and destination addresses and message data;
>
> translating the IP source and destination addresses to internal addresses that are non-forwardable in the external network, the IP source address translated into an internal loop back address reserved for the ingress port, the destination address translated into an internal loop back address reserved for a node within an internal network; and
>
> routing the message data in the internal network based on the internal loop back addresses.

In order to establish a *prima facie* case of anticipation, all the elements of the claimed invention must be found within a single prior art reference. *Dewey & Almy Chemical Co. v. Mimex*, 124 F.2d 986, 52 U.S.P.Q. 138 (2d Cir. 1942). In addition, "[t]he identical invention must be shown in as complete detail as is contained in the . . . claims" and "[t]he elements must be arranged as required by the claim." *Richardson v. Suzuki Motor Co.*, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989); *In re Bond*, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990); M.P.E.P. § 2131 (*emphasis added*). Appellant respectfully submits that *Bal* does not disclose each and every element of independent Claim 1.

For example, *Bal* does not disclose, teach, or suggest "the IP source address translated into an internal loop back address reserved for the ingress port, the destination address translated into an internal loop back address reserved for a node within an internal network,"

as recited in Appellant's Claim 1. To the contrary, *Bal* merely discloses "a method and apparatus for performing network address translation . . . [that] operates by generating statistically unique port numbers for outgoing connections that pass through a network address translation device." (Column 2, lines 22-26). "The statistically unique port numbers are formed from a subset of bits from the port number assigned by the source node." (Column 2, lines 26-29). The *Bal* system applies where "a business may have its local area network with a large number of network nodes coupled to the Internet through an Internet Service Provider (ISP) that only provides a small number of legal Internet addresses." (Column 3, lines 43-46). "To allow all the network nodes on the local area network to access the Internet, a network address translation device needs to be situated between the Internet and the local area." (Column 3, lines 51-54). Thus, the *Bal* system is limited to a system for assigning unique port numbers to allow a large number of network nodes to address the Internet over a limited number of legal Internet addresses.

Specifically, *Bal* discloses that "workstations 142, 144, 146, and 148 each have internal addresses that have been assigned by the network administrator." (Column 3, lines 61-63). "For example, all Internet Protocol (IP) addresses in the form of 10.X.Y.Z where X, Y, and Z are all between 0 and 255 are "Net 10" addresses that are defined to be IP addresses for internal use only." (Column 3, lines 63-67). "[I]f an internal IP address has been assigned to internal server 141, then the network address translation device 130 must link an external IP address and external port with the internal server 141 such that the network address translation device 130 can perform network address translation to enable out [sic] Internet client to access the internal server 141." (Column 4, lines 42-47). "[T]he network address translation module 231 maintains a TCP connection list 233" to keep track of these links. (Column 5, lines 21-26).

Bal discloses distinct network address translation operations for communications initiated internally and communications initiated externally. (Column 4, lines 18-24). For example, if a communication is initiated internally, "network address translation 130 translates the internal IP address and internal port number used by the internal network into a legal external Internet IP address and an external port number used by the network address

translation device 130." (Column 4, lines 30-34). For communications from the external network responsive to communications initiated internally, "network address translation module 231 translates the external port number and external IP address into the internal port number and internal IP address of the internal network node that opened the connection." (Column 5, lines 59-63). However, in neither situation (communications initiated internally nor communications initiated externally), does *Bal* disclose that "the IP source address [is] translated into an *internal loop back address* reserved for the ingress port" or that "the destination address [is] translated into an internal loop back address reserved for a node within an internal network," as recited in Appellant's Claim 1. These features and operations are completely absent from the disclosure of *Bal.*

In paragraph 4(a) of the Final Office Action (p. 3), the Examiner argues that these limitations are disclosed at Column 5, lines 15-25 and 60-63 of *Bal.* However, as described above, these passages of *Bal* only disclose translating an external port number and external IP address (of a communication sent in response to a communication from an internal network node) into the internal port number and internal IP address of the internal network node. There is no specific disclosure of translating an external IP address into a *loop back address.* By way of providing an example and without limitation, the present application identifies one type of loop back address as an address in the Internet Assigned Number Authority (IANA) reserved looped back address space (also referred to as the "127 loop back address space"). There is simply no disclosure of translation of an external address to this type of loop back address or any other type of loop back address. Furthermore, there is no disclosure of the specific limitation of Claim 1 requiring that "the IP source address translated into an internal loop back address reserved for the ingress port, the destination address translated into an internal loop back address reserved for a node within an internal network."

In the Advisory Action, the Examiner continues with the same reasoning from the Final Office Action, arguing that *Bal* teaches the translation of an external IP address into an internal IP address. But again, there is no disclosure of a translating an external IP address into a *loop back address.* The Examiner appears to ignore the specific requirement of a translation into a loop back address. The disclosure of a translation from an external IP

address to an internal IP address (generically, without further disclosure) does not meet the legal requirements for anticipating Claim 1. Given its broadest reasonable meaning when read in light of the specification, the claim term "loop back address" cannot be read so broadly as to mean any internal IP address. Since there is no disclosure in *Bal* that an "IP source address [is] translated into an internal loop back address reserved for the ingress port" or that a "destination address [is] translated into an internal loop back address reserved for a node within an internal network," Appellant respectfully requests allowance of Claim 1.

The Examiner also relies on *Bal* to reject independent Claims 7 and 13. Appellant respectfully submits that *Bal* does not disclose each and every element of Appellant's independent Claims 7 and 13. For example, Claims 7 and 13 each recite that "the IP source address translated into an internal loop back address reserved for the ingress port, the destination address translated into an internal loop back address reserved for a node within an internal network." Thus, for reasons similar to those discussed above with regard to Claim 1, Appellant submits that *Bal* does not disclose each and every element set forth in Appellant's independent Claims 7 and 13. Therefore, Appellant respectfully requests allowance of Claims 7 and 13.

Dependent Claims 3-6, 9-12, and 15-18 depend upon independent Claims 1, 7, and 13, respectively, which Appellant has shown above to be allowable. Accordingly, dependent Claims 3-6, 9-12, and 15-18 are allowable at least because Claims 3-6, 9-12, and 15-18 include the limitations of their respective independent claims. Therefore, Appellant respectfully requests allowance of Claims 3-6, 9-12, and 15-18.

II. The Examiner's Rejection of Dependent Claims 6, 12, and 18 Over *Bal* is Improper

In addition to depending from an allowable independent claim, dependent Claims 6, 12, and 18 are also allowable because *Bal* does not disclose an internal address that includes "a loop back indicator, an identifier of a node in the network and an identifier of an element in the node." As discussed above with regard to Claim 1, *Bal* does not disclose translation into internal loop back addresses. Thus, *Bal* also does not disclose that the internal addresses

comprise a loop back indicator. Furthermore, there is no disclosure in the passage cited by the Examiner that the internal address includes an identifier of an *element* in a node (the node being identified by another identifier in the internal address). For at least these additional reasons, Appellant respectfully requests allowance of Claims 6, 12, and 18.

Conclusion

Appellant has demonstrated that the present invention, as claimed, is clearly distinguishable over the prior art cited by the Examiner. Therefore, Appellant respectfully requests the Board of Patent Appeals and Interferences to reverse the final rejection of the Examiner and instruct the Examiner to issue a notice of allowance of all claims.

Appellant has enclosed a check in the amount of $500.00 for this Appeal Brief. Appellant believes no additional fees are due. The Commissioner is hereby authorized to charge any fee and credit any overpayment to Deposit Account No. 02-0384 of Baker Botts L.L.P.

Respectfully submitted,

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Appendix A: Claims on Appeal

1. (Previously Presented) A method for routing an externally generated message in a network, comprising:

receiving at an ingress port of an internal network a message from an external network, the message comprising internet protocol (IP) source and destination addresses and message data;

translating the IP source and destination addresses to internal addresses that are non-forwardable in the external network, the IP source address translated into an internal loop back address reserved for the ingress port, the destination address translated into an internal loop back address reserved for a node within an internal network; and

routing the message data in the internal network based on the internal loop back addresses.

2. (Canceled)

3. (Original) The method of Claim 1, further comprising:

receiving at an egress port of the network a response to the message, the response comprising internal source and destination addresses and response data;

translating the internal source and destination addresses to external IP addresses; and

transmitting the response data for routing in the external network based on the source and destination IP addresses.

4. (Original) The method of Claim 3, further comprising:

storing an IP source address of the message; and

using the IP source address in translating an internal address of the response for routing in the external network.

5. (Original) The method of Claim 1, wherein the message comprises a control message generated by a management station.

6. (Previously Presented) The method of Claim 1, wherein the internal addresses comprise a loop back indicator, an identifier of a node in the network and an identifier of an element in the node.

7. (Previously Presented) A system for routing an externally generated message in a network, comprising:

means for receiving at an ingress port of an internal network a message from an external network, the message comprising internet protocol (IP) source and destination addresses and message data;

means for translating the IP source and destination addresses to internal addresses that are non-forwardable in the external network, the IP source address translated into an internal loop back address reserved for the ingress port, the destination address translated into an internal loop back address reserved for a node within an internal network; and

means for routing the message data in the internal network based on the internal loop back addresses.

8. (Canceled)

9. (Original) The system of Claim 7, further comprising:

means for receiving at an egress port of the network a response to the message, the response comprising internal source and destination addresses and response data;

means for translating the internal source and destination addresses to external IP addresses; and

means for transmitting the response data for routing in the external network based on the source and destination IP addresses.

10. (Original) The system of Claim 9, further comprising:

means for storing an IP source address of the message; and

means for using the IP source address in translating an internal address of the response for routing in the external network.

11. (Original) The system of Claim 7, wherein the message comprises a control message generated by a management station.

12. (Previously Presented) The system of Claim 7, wherein the internal addresses comprise a loop back indicator, an identifier of a node in the network and an identifier of an element in the node.

13. (Previously Presented) A system for routing an externally generated message in a network, comprising:

logic encoded in media; and

the logic operable to:

receive at an ingress port of an internal network a message from an external network, the message comprising internet protocol (IP) source and destination addresses and message data;

translate the IP source and destination addresses to internal addresses that are non-forwardable in the external network, the IP source address translated into an internal loop back address reserved for the ingress port, the destination address translated into an internal loop back address reserved for a node within an internal network; and

route the message data in the internal network based on the internal loop back addresses.

14. (Canceled)

15. (Original) The system of Claim 13, the logic further operable to receive at an egress port of the network a response to the message, the response comprising internal source and destination addresses and response data, to translate the internal source and destination addresses to external IP addresses and to transmit the response data for routing in the external network based on the source and destination IP addresses.

16. (Original) The system of Claim 15, to logic further operable to store an IP source address of the message and use the IP source address in translating an internal address of the response for routing in the external network.

17. (Original) The system of Claim 13, wherein the message comprises a control message generated by a management station.

18. (Previously Presented) The system of Claim 13, wherein the internal addresses comprise a loop back indicator, an identifier of a node in the network and an identifier of an element in the node.

Appendix B: Evidence

NONE

Appendix C: Related Proceedings

NONE